§ 145.105 Performance standards.

Except as provided in §145.2, each holder of a certificate issued under this subpart shall perform its maintenance and preventive maintenance operations in accordance with part 43 of this chapter.

[Amdt. 145–7, 31 FR 10614, Aug. 9, 1966]

APPENDIX A TO PART 145

NOTE: When an asterisk (*) is shown after any job function listed in this appendix it indicates that the applicant need not have the equipment and material on his premises for performing this job function provided he contracts that particular type work to an outside agency having such equipment and material.

(a) An applicant for a Class 1, 2, 3, or 4 airframe rating must provide equipment and material necessary for efficiently performing the following job functions:

(1) Steel structural components:

Repair or replace steel tubes and fittings using the proper welding techniques when appropriate.

Anticorrosion treatment of the interior and exterior of steel parts,

Metal plating or anodizing*,

Simple machine operations such as making bushings, bolts, etc.,

Complex machine operations involving the use of planers, shapers, milling machines, etc.*,

Fabricate steel fittings,

Abrasive air blasting and chemical cleaning operations*,

Heat treatment*,

Magnetic inspection*,

Repair or rebuilt metal tanks*.

(2) Wood structure:

Splice wood spars,

Repair ribs and spars (wood),

Fabricate wood spars*,

Repair or replace metal ribs,

Interior alignment of wings,

Repair or replace plywood skin,

Treatment against wood decay.

(3) Alloy skin and structural components:

Repair and replace metal skin, using power tools and equipment,

Repair and replace alloy members and components such as tubes, channels, cowlings, fittings, attach angles, etc.,

Alignment of components using jigs or fixtures as in the case of joining fuselage sections or other similar operations,

Make up wooden forming blocks or dies,

Fluorescent inspection of alloy components*,

Fabricate alloy members and components such as tubes, channels, cowlings, fittings, attach angles, etc.*

(4) Fabric covering:

Repairs to fabric surfaces,

Recovering and refinishing of components and entire aircraft*.

(5) Control systems:

Renewing control cables, using swaging and splicing techniques,

Rigging complete control system,

Renewing or repairing all control system hinge point components such as pins, bushings, etc.,

Install control system units and components.

(6) Landing gear systems:

Renew or repair all landing gear hinge point components and attachments such as bolts, bushings, fittings, etc.,

Overhaul and repair elastic shock absorber units,

Overhaul and repair hydraulic-pneumatic shock absorber units*,

Overhaul and repair brake system components*,

Conduct retraction cycle tests,

Overhaul and repair electrical circuits,

Overhaul and repair hydraulic system components*,

Repair or fabricate hydraulic lines.

(7) Electric wiring systems:

Diagnose malfunctions,

Repair or replace wiring,

Installation of electrical equipment,

Bench check electrical components (this check is not to be confused with the more complex functional test after overhaul).

(8) Assembly operations:

Assembly of airframe component parts such as landing gear, wings, controls, etc.,

Rigging and alignment of airframe components, including the complete aircraft and control system,

Installation of powerplants,

Installation of instruments and accessories,

Assembly and fitting of cowling, fairings, etc.,

Repair and assembly of plastic components such as windshields, windows, etc.,

Jack or hoist complete aircraft.

Conduct aircraft weight and balance operations (this function will be conducted in draft-free area)*,

Balance control surfaces.

(b) An applicant for any class of powerplant rating must provide equipment and material necessary for efficiently performing the following job functions appropriate to the class of rating applied for:

(1) Classes 1 and 2. (i) Maintain and alter powerplants, including replacement of parts:

Chemical and mechanical cleaning,

Disassembly operations,

Replacement of valve guides and seats*,

Replacement of bushings, bearings, pins, inserts, etc.,

Plating operations (copper, silver, cadmium, etc.)*,

Heating operations (involving the use of recommended techniques requiring controlled heating facilities),
Chilling or shrinking operations,
Removal and replacement of studs,
Inscribing or affixing identification information,
Painting of powerplants and components,
Anticorrosion treatment for parts,
Replacement and repair of powerplant alloy sheet metal and steel components such as baffles, fittings, etc.*

(ii) Inspect all parts, using appropriate inspection aids:
Magnetic, fluorescent and other acceptable inspection aids*,
Precise determination of clearances and tolerances of all parts,
Inspection for alignment of connecting rods, crankshafts, impeller shafts, etc.,
Balancing of parts, including crankshafts, impellers, etc.*,
Inspection of valve springs.

(iii) Accomplish routine machine work:
Precision grinding, honing and lapping operations (includes crankshaft, cylinder barrels, etc.)*,
Precision drilling, tapping, boring, milling and cutting operations*,
Reaming of inserts, bushings, bearings and other similar components,
Refacing of valves.

(iv) Perform assembly operations:
Valve and ignition timing operations,
Fabricate and test ignition harnesses,
Fabricate and test rigid and flexible fluid lines,
Prepare engines for long- or short-term storage,
Functional check powerplant accessories (this check is not to be confused with the more complex performance test of overhaul)*,
Hoist engines by mechanical means,
Install engines in aircraft*,
Align and adjust engine controls*,
Installation of engines in aircraft and alignment and adjustment of engine controls, when completed, must be inspected by either an appropriately rated certificated mechanic or certificated repairman. Persons supervising or inspecting these functions must thoroughly understand the pertinent installation details involved.

(v) Test overhauled powerplants in compliance with manufacturers' recommendations: The test equipment will be the same as recommended by the manufacturers of the particular engines undergoing test or equivalent equipment that will accomplish the same purpose. The testing function may be performed by the repair station itself, or may be contracted to an outside agency. In either case the repair station will be responsible for the final acceptance of the tested engine.

(2) Class 3. Functional and equipment requirements for turbine engines will be governed entirely by the recommendations of the manufacturer, including techniques, inspection methods, and test.

(c) An applicant for any class of propeller rating must provide equipment and material necessary for efficiently performing the following job functions appropriate to the class of rating applied for:

(1) Class 1. (i) Maintain and alter propellers, including installation and replacement of parts:
Replace blade tipping,
Refinish wood propellers,
Make wood inlays,
Refinish plastic blades,
Straighten bent blades within repairable tolerances,
Modify blade diameter and profile,
Polish and buff,
Painting operations,
Remove from and reinstall on powerplants.

(ii) Inspect components, using appropriate inspection aids:
Inspect propellers for conformity with manufacturer's drawings and specifications,
Inspect hubs and blades for failures and defects, using magnetic or fluorescent inspection devices*,
Inspect hubs and blades for failures and defects, using all visual aids, including the etching of parts,
Inspect hubs for wear of splines or keyways or any other defect.

(iii) Repair or replace components: (Not applicable to this class).

(iv) Balance propellers:
Test for proper track on aircraft,
Test for horizontal and vertical unbalance (this test will be accomplished with the use of precision equipment).

(v) Test propeller pitch-changing mechanisms: (Not applicable to this class).

(2) Class 2. (i) Maintain and alter propellers, including installation and the replacement of parts:
All functions listed under paragraph (c)(1)(i) of this appendix when applicable to the make and model propeller for which a rating is sought,
Properly lubricate moving parts,
Assemble complete propeller and subassemblies, using special tools when required.

(ii) Inspect components, using appropriate inspection aids: All functions listed under paragraph (c)(1)(ii) of this appendix when applicable to the make and model propeller for which a rating is sought.

(iii) Repair or replace component parts:
Replace blades, hubs, or any of their components,
Repair or replace anti-icing devices,
Remove nicks or scratches from metal blades,
Repair or replace electrical propeller components.

(iv) Balance propellers: All functions listed under paragraph (c)(1)(iv) of this appendix when applicable to the make and model propeller for which a rating is sought.

(v) Test propeller pitch-changing mechanism:

Test hydraulically, propellers and components,

Test electrically operated propellers and components,

Test of constant speed devices*.

(d) An applicant for a radio rating must provide equipment and materials as follows:

(1) For a Class 1 (Communications) radio rating, the equipment and materials necessary for efficiently performing the job functions listed in paragraph (4) and the following job functions:

The testing and repair of headsets, speakers, and microphones.

The measuring of radio transmitter power output.

(2) For a Class 2 (Navigation) radio rating, the equipment and materials necessary for efficiently performing the job functions listed in paragraph (4) and the following job functions:

The testing and repair of headsets.

The testing of speakers.

The repair of speakers.*

The measuring of loop antenna sensitivity by appropriate methods.

The determination and compensation for quadrantal error in aircraft direction finder radio equipment.

The calibration of any radio navigational equipment, enroute and approach aids, or similar equipment, appropriate to this rating to approved performance standards.

(3) For Class 3 (Radar) radio rating, the equipment and materials necessary for efficiently performing the job functions listed in paragraph (4) and the following job functions:

The measuring of radio transmitter power output.

The metal plating of transmission lines, wave guides, and similar equipment in accordance with appropriate specifications.*

The pressurization of appropriate radar equipment with dry air, nitrogen, or other specified gases.

(4) For all classes of radio ratings, the equipment and materials necessary for efficiently performing the following job functions:

Perform physical inspection of radio systems and components by visual and mechanical methods.

Perform electrical inspection of radio systems and components by means of appropriate electrical and/or electronic test instruments.

Check aircraft wiring, antennas, connectors, relays, and other associated radio components to detect installation faults.

Check engine ignition systems and aircraft accessories to determine sources of electrical interference.

Check aircraft power supplies for adequacy and proper functioning.

Test radio instruments.*

Overhaul, test, and check dynamotors, inverters, and other radio electrical apparatus.*

Paint and refinish equipment containers.*

Accomplish appropriate methods of marking calibrations, or other information on radio control panels and other components, as required.*

Make and reproduce drawings, wiring diagrams, and other similar material required to record alterations and/or modifications to radio (photographs may be used in lieu of drawings when they will serve as an equivalent or better means of recording).*

Fabricate tuning shaft assemblies, brackets, cable assemblies, and other similar components used in radios or aircraft radio installations.*

Align tuned circuits (RF and IF).

Install and repair aircraft antennas.

Install complete radio systems in aircraft and prepare weight and balance reports* (That phase of radio installation requiring alterations to the aircraft structure must be performed, supervised, and inspected by qualified personnel).

Measure modulation values, noise, and distortion in radios.

Measure audio and radio frequencies to appropriate tolerances and perform calibration necessary for the proper operation of radios.

Measure radio component values (inductance, capacitance, resistance, etc.).

Measure radiofrequency transmission line attenuation.

Determine wave forms and phase in radios when applicable.

Determine proper aircraft radio antenna, lead-in and transmission line characteristics and locations for type of radio equipment to which connected.

Determine operational condition of radio equipment installed in aircraft by using appropriate portable test apparatus.

Determine proper location for radio antennas on aircraft.

Test all types of electronic tubes, transistors, or similar devices in equipment appropriate to the rating.

(e) An applicant for any class of instrument rating must provide equipment and material necessary for efficiently performing the following job functions, in accordance with pertinent specifications and manufacturers' recommendations, appropriate to the class of rating applied for:

(1) Class 1. (i) Diagnose instrument malfunctions: Diagnose malfunctioning of the following instruments:

Rate of climb indicators,

Altimeters,

Air speed indicators,
Vacuum indicators,
Oil pressure gauges,
Fuel pressure gauges,
Hydraulic pressure gauges,
Deicing pressure gauges,
Pitot-static tube,
Direct indicating compasses,
Accelerometer,
Direct indicating tachometers,
Direct reading fuel quantity gauges,
Optical (sextants, drift sights, etc.)*.

(ii) Maintain and alter instruments, including installation and replacement of parts:

Perform these functions on instruments listed under paragraph (e)(1)(i) of this appendix.

The function of installation includes fabrication of instrument panels and other installation structural components. The repair station should be equipped to perform this function. However, it may be contracted to a competent outside agency equipped to perform the function.

(iii) Inspect, test and calibrate instruments: Perform these functions on instruments listed under paragraph (e)(1)(i) of this appendix, on and off the aircraft, when appropriate.

(2) Class 2. (i) Diagnose instrument malfunctions: Diagnose malfunctioning of the following instruments:

Tachometers,
Synchroscope,
Electric temperature indicators,
Electric resistance type indicators,
Moving magnet type indicators,
Resistance type fuel indicators,
Warning units (oil-fuel),
Selsyn systems and indicators,
Self-synchronous systems and indicators,
Remote indicating compasses,
Fuel quantity indicators,
Oil quantity indicators,
Radio indicators,
Ammeters,
Voltmeters.

(ii) Maintain and alter instruments, including installation and the replacement of parts:

Perform these functions on instruments listed under paragraph (e)(2)(i) of this appendix.

The function of installation includes fabrication of instrument panels and other installation structural components. The repair station should be equipped to perform this function. However, it may be contracted to a competent outside agency equipped to perform the function.

(iii) Inspect, test and calibrate instruments: Perform these functions on instruments listed under paragraph (e)(2)(i) of this appendix, on and off the aircraft, when appropriate.

(3) Class 3. (i) Diagnose instrument malfunctions: Diagnose malfunctioning of the following instruments:

Turn and bank indicators,
Directional gyros,
Horizon gyros,
Auto pilot control units and components*,
Remote reading direction indicators*.

(ii) Maintain and alter instruments, including installation and replacement of parts:

Perform these functions on instruments listed under paragraph (e)(3)(i) of this appendix.

The function of installation includes fabrication of instrument panels and other installation structural components. The repair station should be equipped to perform this function. However, it may be contracted to a competent outside agency equipped to perform the function.

(iii) Inspect, test and calibrate instruments: Perform these functions on instruments listed under paragraph (e)(3)(i) of this appendix, on and off the aircraft, when appropriate.

(4) Class 4. (i) Diagnose instrument malfunctions: Diagnose malfunctioning of the following instruments:

Capacitance type quantity gauge,
Other electronic instruments,
Engine analyzers.

(ii) Maintain and alter instruments, including installation and replacement of parts:

Perform these functions on instruments listed under paragraph (e)(4)(i) of this appendix.

The function of installation includes fabrication of instrument panels and other installation structural components. The repair station should be equipped to perform this function. However, it may be contracted to a competent outside agency equipped to perform the function.

(iii) Inspect, test and calibrate instruments: Perform these functions on instruments listed under paragraph (e)(4)(i) of this appendix, on and off the aircraft, when appropriate.

(f) An applicant for a Class 1, 2, or 3 accessory rating must provide equipment and material necessary for efficiently performing the following job functions, in accordance with pertinent specifications and the manufacturers' recommendations:

(1) Diagnose accessory malfunctions.

(2) Maintain and alter accessories, including installation and the replacement of the parts.

(3) Inspect, test, and, where necessary, calibrate accessories.

(Secs. 313, 314, and 601 through 610, of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1354, 1355, 1421 through 1430); sec. 6(c), Dept. of Transportation Act (49 U.S.C. 1655(c)))

[Doc. No. 1157, 27 FR 11693, Nov. 28, 1962, as amended by Amdt. 145–14, 35 FR 19349, Dec. 22, 1970; Amdt. 145–19, 47 FR 33391, Aug. 2, 1982]

PART 147—AVIATION MAINTENANCE TECHNICIAN SCHOOLS

Subpart A—General

Subpart B—Certification Requirements

Subpart C—Operating Rules

AUTHORITY: 49 U.S.C. 106(g), 40113, 44701–44702, 44707–44709.

SOURCE: Docket No. 1157, 27 FR 6669 July 13, 1962, unless otherwise noted.

Subpart A—General

§ 147.1 Applicability.

This part prescribes the requirements for issuing aviation maintenance technician school certificates and associated ratings and the general operating rules for the holders of those certificates and ratings.

§ 147.3 Certificate required.

No person may operate as a certificated aviation maintenance technician school without, or in violation of, an aviation maintenance technician school certificate issued under this part.

[Doc. No. 15196, 41 FR 47230, Oct. 28, 1976]

§ 147.5 Application and issue.

(a) An application for a certificate and rating, or for an additional rating, under this part is made on a form and in a manner prescribed by the Administrator, and submitted with—

(1) A description of the proposed curriculum;

(2) A list of the facilities and materials to be used;

(3) A list of its instructors, including the kind of certificate and ratings held and the certificate numbers; and

(4) A statement of the maximum number of students it expects to teach at any one time.

(b) An applicant who meets the requirements of this part is entitled to an aviation maintenance technician school certificate and associated ratings prescribing such operations specifications and limitations as are necessary in the interests of safety.

[Docket No. 1157, 27 FR 6669, July 13, 1962, as amended by Amdt. 147–5, 57 FR 28959, June 29, 1992]

§ 147.7 Duration of certificates.

(a) An aviation maintenance technician school certificate or rating is effective until it is surrendered, suspended, or revoked.